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Ms. Cynthia T. Brown  
Chief, Section of Administration  
Office of Proceedings  
Surface Transportation Board  
395 E Street, S.W.  
Washington, DC 20423

Re: EP 558 (Sub-No. 19), *Railroad Cost of Capital — 2015*

Dear Ms. Brown:

Pursuant to the corrected decision served by the Board on March 10, 2016, attached please find the Rebuttal Comments of the Association of American Railroads (AAR) in the above captioned proceeding.

Respectfully submitted,

Timothy J. Strafford  
Counsel for the Association of  
American Railroads

**BEFORE THE  
SURFACE TRANSPORTATION BOARD**

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RAILROAD COST OF )  
CAPITAL — 2015 )  
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EP 558 (Sub-No. 19)

**REBUTTAL COMMENTS OF THE ASSOCIATION OF AMERICAN RAILROADS  
AND ITS MEMBER RAILROADS**

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By corrected decision served on March 10, 2016, the Surface Transportation Board (“STB” or “Board”) instituted this proceeding to determine the railroad industry’s cost of capital for the year 2015. In its order, the Board specifically sought comment on four issues: “(1) the railroads’ 2015 current cost of debt capital; (2) the railroads’ 2015 current cost of preferred equity capital (if any); (3) the railroads’ 2015 cost of common equity capital; and (4) the 2015 capital structure mix of the railroad industry on a market value basis.” *R.R Cost of Capital – 2015*, EP No. 558 (Sub-No. 19) (STB served Mar. 10, 2016) (“March decision”). The decision also stated that this proceeding does not affect the ongoing proceeding that has resulted from Western Coal Traffic League’s (“WCTL”) petition for rulemaking in EP 664 (Sub-No. 2), *Petition of the Western Coal Traffic League to Institute a Rulemaking Proceeding to Abolish the Use of the Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry’s Cost of Capital. Id.*

On April 20, 2016, the railroads, through the Association of American Railroads (“AAR”), submitted their calculation of the 2015 cost of capital using the methodology specified

by the Board. The AAR calculated the railroads' overall cost of capital for 2015 at 9.61 percent, including a cost of common equity of 10.96 percent and a cost of debt of 3.55 percent.

On May 11, 2016, WCTL filed reply comments. As it has done for the last several years, WCTL did not challenge any aspect of the AAR's calculations, but instead collaterally attacked the Board's methodology to calculate the cost-of-equity component of the cost of capital. In so doing, WCTL repeated arguments it has made in the pending EP 664 (Sub-No. 2) proceeding or in previous EP 558 proceedings, despite the clear admonitions of the Board that the annual EP 558 proceeding is not the proper forum to raise such arguments.

This year, WCTL claims that the Board's methodology produces a cost of capital estimate that exceeds estimates used by investors. WCTL persists in arguing that the Board's Multi-Stage Discounted Cash Flow Model ("Morningstar/Ibbotson MSDCF") does not properly account for stock repurchases. WCTL claims that the presence of KCS in the composite railroad has a disproportionate effect on the growth rates used in the second stage of the MSCDF. WCTL also continues to selectively criticize aspects of the Board's Capital Asset Pricing Model ("CAPM") it believes produce a cost-of-equity estimate that is too high, while ignoring aspects that may cause the estimate to be too low. Finally, WCTL suggests the Board should deviate from current Generally Accepted Accounting Principles and treat operating leases as debt before the effective date of accounting changes suggested by the Financial Accounting Standards Board ("FASB").

Taken together, WCTL has presented what it always presents in the annual EP 558 proceeding: self-interested, repetitive, and irrelevant argument seeking to drive the railroad industry cost of capital to a value lower than the Board's considered methodology would

produce. To do so, WCTL relies on selective calculations that are either incorrect or deceptive. For the reasons explained below, the Board should not make any of the adjustments to its methodology advocated by WCTL. Ultimately, WCTL did not and cannot contend the AAR has incorrectly executed the Board's instructions or has not calculated the railroad industry's cost of capital for 2015 according to the Board's rules. Nonetheless, the AAR responds to WCTL's reply comments merely to highlight that the selective attacks on the Board's methodology lack merit.

## **Discussion**

### **I. The Board Should Not Deviate from its Established Methodology in this Proceeding**

The Board has properly observed that "[i]t is settled administrative law that an agency need not, and as a matter of sound procedure should not, permit parties to relitigate generic rules in individual proceedings that apply those rules." *R.R. Cost of Capital – 2008*, EP 558 (Sub-No. 12), at 2 (STB served Sept. 25, 2009) (citing *Tribune Co. v. FCC*, 133 F.3d 61, 68 (D.C. Cir. 1998)). The Board has been consistently clear that challenges to the Board's established cost-of-capital methodology are beyond the scope of the annual cost of capital calculation proceeding so as to avoid parties seeking to bias the calculation in their favor. The Board has repeatedly stated that the annual EP 558 cost-of-capital determination is not an appropriate forum to raise methodological issues or propose changes to the Board's rules.<sup>1</sup> The Board has been so clear that WCTL was forced to acknowledge those statements in its filing. Even so, WCTL persists in

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<sup>1</sup> See, e.g., *R.R. Cost of Capital – 2010*, EP 558 (Sub-No. 14)(STB served Oct. 3, 2011) (citing *Methodology to be Employed in Determining the Railroad Industry's Cost of Capital*, EP 664, slip op. at 18 (STB served Jan. 17, 2008)).

raising methodological challenges in the annual determination because the timing of the rulemaking process has not been to its liking. WCTL Reply at 2.

The Board's rationale for insisting that all methodological challenges be raised and vetted in a broader rulemaking context is entirely sound. The Board established its methodology to estimate the cost of equity for the railroad industry through a multi-year, multi-proceeding process. Because the cost of equity never reveals itself, even historically, there is no way to select a single "correct" model. All financial techniques used to estimate the cost of equity are inherently imprecise; the results vary from year to year and are sensitive to assumptions that are just that, assumptions. As the Board concluded, "if our exploration of this issue has revealed nothing else, it has shown that there is no single simple or correct way to estimate the cost of equity for the railroad industry, and countless reasonable options are available."<sup>2</sup> The Board thus chose to follow the best practice of using multiple models. And for the MSDCF model, the agency concluded "it is prudent to use an approach that was not developed simply as a tool for litigation before the Board, but rather to use an approach that has been tested in the marketplace and is used to estimate the cost of equity for different industries, not just the rail industry."<sup>3</sup> Moreover, because the railroad cost of capital plays a key role in regulatory applications each year, it is particularly important to use a consistent approach to calculating the cost of capital.

The Board has thus long understood that permitting a party like WCTL to make selective, cherry-picked presentations in the annual cost-of-capital calculation — without considering the

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<sup>2</sup> *Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital*, EP 664 (Sub-No. 1), slip op. at 15 (STB served Jan. 28, 2009) ("*MSDCF Decision*").

<sup>3</sup> *Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital*, EP 664 (Sub-No. 1), slip op. at 6 (STB served Aug. 11, 2008).

totality of the model — should not be allowed. In this proceeding, WCTL has offered exactly the sort of selective, results-oriented proposals that have no place in the annual determination, seeking to bias the calculation down, without addressing any of the issues in the methodology that would cause the calculation to increase. Moreover, the Board has developed an extensive record in EP 664 (Sub-No. 2) and has an obligation to fully consider the record and testimony compiled in that proceeding — not to short circuit that process on behalf of WCTL. The Board should continue to apply its established methodology unless and until it decides in the EP 664 (Sub-No. 2) proceeding to make changes to its methodology.

## **II. WCTL’s Selective Use of Excerpts from a Single Analyst Report Cannot be Relied on for Sweeping Generalizations**

If the Board chooses to consider the specific arguments raised by WCTL, it should reject them as without merit. For example, WCTL has not supported its claim the Board’s cost of capital methodology produces an overstated estimate. In its opening evidence, the AAR calculated the railroad industry’s cost of capital for 2015 by applying the Board’s established procedures and instructions in this proceeding. WCTL replied by submitting selections from a single investment analyst report prepared by Morgan Stanley to stand for the sweeping conclusion that the AAR’s calculations “substantially overstate the values used by the financial and investment community.” WCTL Reply at 2.

The excerpts submitted by WCTL cannot be relied on by the Board as indicative of what the financial and investment community estimates the railroad industry’s cost of capital to be. Neither the submitted excerpts, nor WCTL’s argument, provide any clear insight into the assumptions underlying the Morgan Stanley report or the purposes to which their weighted average cost of capital (“WACC”) estimates are intended. In stark contrast to the AAR’s

opening submission, which included ample and transparent support for all of the data applied to the Board's established methodology, there is no way for the Board to know how Morgan Stanley arrived at its estimates of the submitted companies' WACC. Though WCTL points to the Morgan Stanley WACC estimate for Union Pacific, the report excerpt merely states that "we use a 10-year DCF assuming 7.2 % WACC." WCTL Reply Exhibit A at 34. In another excerpt, Morgan Stanley discusses a risk-free rate of 3 percent, which suggests a form of CAPM was involved in developing the WACC used by Morgan Stanley. The reference to a DCF model appears to refer to the calculation of a stock price target, but based on the excerpts submitted no firm conclusions can be established.<sup>4</sup>

Moreover, an investment analyst's conclusions about the cost of capital are of limited probative value to the Board. The Board and investment analysts have very different reasons for utilizing a cost of capital estimate. The Board has noted it uses its annual cost of capital estimate in "the determination of railroad revenue adequacy for 2015. It may also be used in other Board railroad proceedings, including, but not limited to, those involving the prescription of maximum reasonable rate levels; the determination of trackage rights compensation; the proposed abandonments of rail lines; railroad mergers; and applications to purchase feeder lines." March decision at 1. By contrast, investment analysts like those that prepared the Morgan Stanley report are seeking to derive an optimal stock price, and use a variety of data to guide investors in deciding whether or not the company's stock price is likely

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<sup>4</sup> WCTL even concedes it has no idea how the WACC used in the Morgan Stanley report deals with taxes. WCTL Reply at 3. WCTL assumes the problem away by positing speculative values and applying them to the WACC, further muddying the waters of what those numbers represent. *See id.*

to rise or fall. This guess at the future direction of a company's stock price is narrower than the Board's objective of estimating the railroad industry's cost of capital for the preceding year to be used for a variety of regulatory purposes.

Finally, WCTL's views on the relevance of an analyst report from two months after the end of the 2015 analysis period is a stark reversal from its own position just a few years ago. In *Railroad Cost of Capital – 2008*, EP 558 (Sub-No. 12), WCTL objected to the use of AAR calculations utilizing stock data from March, though those calculations were completely consistent with the Morningstar/Ibbotson MSDCF that the Board adopted. Then, WCTL claimed that “utilization of data from three months later is inherently improper.” WCTL Reply, EP 558 (Sub-No. 12) at 7 (filed May 20, 2009). Now, WCTL praises a report issued two months after the analysis year as “very close to the December 31, 2015 date used in most of the AAR's calculations.” WCTL Reply at 3. WCTL's attempt to have it both ways underscores that its only consistent position is to lower the cost of capital.

### **III. The Morningstar/Ibbotson MSDCF Does Not Overstate Growth Rates Because of Stock Repurchases**

WCTL reiterates its perennial, but unfounded, contention that stock repurchases by some railroads “taint” the use of earning per share growth rates in the Ibbotson/Morningstar MSDCF. The Board correctly rejected this argument when it was first raised in 2008.<sup>5</sup> Nothing has changed since then to warrant reconsideration of that decision.

This year, WCTL cites to a recent paper by Philip Straehl and Roger Ibbotson, claiming that it addresses “the need to recognize the impact of buybacks on growth in EPS in analyzing

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<sup>5</sup> *Use of a Multi Stage Discounted Cash Flow Model in Determining the Railroad Industry Cost of Capital*, EP 664 (Sub-No. 1), slip op. at 12 (STB served Jan. 28, 2009).

growth in returns.” WCTL Reply at 5. The Straehl/Ibbotson paper is focused on the effect of stock repurchases on calculating historical EPS growth rates. However, the Morningstar/Ibbotson MSDCF does not rely on historical EPS data to establish growth rates. Instead, the first stage of the Morningstar/Ibbotson MDSCF utilizes the median value of the qualifying railroads’ three-to five-year future growth estimates as determined by railroad industry analysts, and published by Institutional Brokers Estimate (“IBES”). The paper does not conclude that the IBES analysts’ growth rates used in the Morningstar/Ibbotson MSDCF are overstated because of repurchases, or for any other reason.

Moreover, WCTL’s preoccupation with growth rates continues to ignore the overall effect of the timing of cash flows available to shareholders. As demonstrated by AAR in EP 664 (Sub-No. 2), stock repurchases do not bias the cost-of-equity results of the Morningstar/Ibbotson MSDCF upwardly. Instead, they may have the effect of causing the cost of equity to be understated, because the model does not explicitly include such distributions in its consideration of free cash flows to shareholders. Thus, the model does not fully reflect the reality that distributions to shareholders are shifted forward in time by repurchases, and therefore the model understates the cash flows that shareholders expect to receive in earlier years, while overstating the cash flows available in later years. Holding everything else constant, shifting forward the expected cash flows should raise the cost of equity estimate since the present value of a dollar received today is always (unless we have deflation) greater than the present value of that same dollar received at some future date. *See* AAR Opening Comments at 34-36, Villadsen Opening V.S. at 14-18, EP 664 (Sub-No. 2) (filed Sept. 14, 2014). The Morningstar/Ibbotson MSDCF

may thus understate the cost of equity by failing to shift the cash flows forward. WCTL continues to ignore all of the impacts of the stock repurchases on the model.

#### **IV. The Board Should Disregard WCTL's Selective Challenge to the Second Stage Industry Growth Rate in the MSDCF Model**

WCTL attempts a novel spin on its repeated objection to including Kansas City Southern ("KCS") in the cost-of-capital calculation. In its opening evidence, AAR included KCS because the railroad meets the stated criteria of *Railroad Cost of Capital – 1984*, 1 I.C.C.2d 989 (1985), as modified in the Board's order instituting this proceeding. WCTL claims in its reply that the Morningstar/Ibbotson MSDCF gives KCS "a disproportionate impact on the average" of the firms' growth rates that make up the second-stage growth rate.

The Board should disregard this criticism for two reasons. First, WCTL's criticism misunderstands the Morningstar/Ibbotson MSDCF second-stage growth rate. The MSDCF does not utilize a weighted average to establish the second stage growth rate because it assumes "that over a middle horizon, growth of any particular company will lie more in line with the industry as a whole." *See, e.g., 2013 Ibbotson SBBI Valuation Yearbook* at 51. As explained in the verified statement of John Gray accompanying AAR's opening statement, the simple average is intended to model the fact that "other companies 'catch' their industry growth leaders, or the leaders fall back to the rate of the slower growth railroads. Therefore, in this stage, the cash flows at the end of year five are assumed to grow at the simple (not weighted) average of the individual firm medians used in the first stage." AAR Opening Comments, Gray V.S. at 41.

Second, and more fundamentally, cherry-picking assumptions within the Morningstar/Ibbotson MSDCF model is inappropriate and a vintage WCTL strategy. If the Board sought to modify the Morningstar/Ibbotson model, it would have to consider all the

assumptions within the model. One example is the correct phase-in period to the steady-state (Stage 3) for the railroad industry. As part of this analysis, the Board would need to consider whether determining the correct period would depend on: (a) projected traffic growth for the entire transportation industry, and (b) how long the railroads will continue to invest heavily to renew existing infrastructure and capacity growth. In addition, the lengths of the stages may change as the industry evolves, requiring an annual determination of the appropriate future time period for assumption of steady-state cash flows.

The AAR has previously explained in EP 664 (Sub-No. 2) that if one starts tinkering with the assumptions within the Morningstar/Ibbotson MSDCF model, there are other assumptions that would also demand scrutiny, as well. For example, the model assumes that in the steady-state (Stage 3), capital expenditures will consist just of maintenance capital (no growth capital), so that capital expenditures and depreciation are equal. Further, because deferred taxes are linked to capital expenditures, this amount is expected to disappear as capital expenditures approach maintenance levels in the long term steady-state equilibrium. The steady-state of the railroad industry is reached when true economic depreciation—the decline in the *market* value of rail assets attributable to their usage in that year—equals capital expenditures. In the steady-state, the assumption is that economic depreciation and capital expenditures will converge. However, the model relies on an accounting measure of depreciation. It is thus likely that an observed spread between accounting depreciation and capital expenditures will extend far into the steady-state, because accounting depreciation is based on book values rather than current costs. The use of accounting depreciation—if less than the true economic depreciation of assets—will bias the

MSDCF downwardly as it is additive in Stages 1 and 2 (while capital expenditures are subtracted).

Due to these complexities, the Board has set a high bar for any party seeking to modify the method used to estimate the cost of capital. Understanding that switching the “methodology will have a widespread impact on the industry,”<sup>6</sup> the STB has properly cautioned that it will not depart from its established approach unless a party “presents compelling evidence that it is flawed.”<sup>7</sup> Even if the STB were to consider another challenge to its established methodology in this proceeding—and it should not—WCTL’s selective attack on the inclusion of KCS in the simple average growth rate falls well short of this demanding standard.

**V. WCTL’s Selective Criticisms of Aspects of CAPM Raised in this Proceeding are Baseless**

**A. Market Risk Premium**

WCTL also suggests one-sided adjustments to CAPM intended to lower the cost of equity. WCTL advocates a market risk premium lower than the numbers recommended by its own members, and then uses the wrong risk free rate with the market risk premium that it recommends. WCTL notes that the Ibbotson/Morningstar historical market risk premium is now published by Duff & Phelps and suggests that Duff & Phelps “recommends use of a lower MRP [market risk premium], 5% as of December 31, 2015 (and 5.5% as of January 31, 2016).” But the very document linked to in WCTL states that the Duff & Phelps recommended 5.0% market risk premium is to be “matched with a normalized risk free rate of 4.0%.” *See* Appendix AA.

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<sup>6</sup> *R.R. Cost of Capital – 2005*, EP 558, slip op. at 5 (STB served Feb. 9, 2007).

<sup>7</sup> *Id.* at 4.

That is, though Duff & Phelps' recommendation is for a lower MRP, it includes a *higher* risk-free rate. The two largely offset each other.

WCTL's calculation of a cost of capital using only CAPM to calculate the cost of equity with AAR weights, beta, and risk-free rate with a 5.0 percent MRP results in a bogus conclusion. WCTL says its calculation of a 7.70 percent cost of capital is "...virtually identical to the Morgan Stanley UP-based figure. The closeness confirms that the Board would greatly improve its estimate...." However, the WCTL calculation should have used the 4.00 percent risk-free rate recommended by Duff & Phelps if it was going to use a 5.00 market risk premium recommended by Duff & Phelps. It also appears WCTL accidentally used 3.5 percent for the cost of debt instead of 3.55. The WCTL calculation, with these two corrections, results in a cost of capital of 8.89 percent – not the 7.70 percent claimed. *See* AAR Appendix BB. Further, if one were to substitute Duff & Phelps' latest market risk premium recommendation of 5.5 percent, a weighted average cost of capital of 9.39 percent would be calculated.

The AAR believes the WCTL's MRP and corrected cost of capital calculation are too low, and so do WCTL's members. As demonstrated by the AAR in EP 664 (Sub-No. 2), some of WCTL's members have advocated for MRPs ranging from 7% to almost 11% in proceedings before their own regulators. AAR oral argument exhibits, EP 664 (Sub-No. 2) (filed April 23, 2015). Using the median MRP for 2015 (9.1 percent) from the AAR's EP 664 (Sub-No. 2) table showing the MRP recommended by WCTL members, the CAPM-only cost of capital would rise to 11.79 percent using the STB's beta and risk-free rate.

B. Beta

WCTL also takes issue with AAR's interpretation of the Beta calculation, though it does not actually challenge the AAR's calculation. WCTL Reply at 10-11. It is perplexing that WCTL has doubts about a seven-year trend, but believes a two-year trend "may be more representative." WCTL does not dispute that the AAR calculated Beta according to the Board's established procedures. *See* AAR Opening Comments, Gray V.S. at 30-34. WCTL's speculations regarding the effects of lower energy prices on railroad risk are largely irrelevant to this proceeding. However, had WCTL thought through the impact of low natural gas prices on rail coal volumes, it almost certainly would have come to the same conclusion as did the AAR – that these price declines have clearly increased industry risk.

One area in which the AAR can agree at least in part with WCTL is its assessment of the 2009-2015 period as unusual in terms of the interest rate environment. Interest rates are currently very low, holding down the results of a CAPM calculation. Notably, WCTL does not acknowledge, let alone raise concerns about, how aberrationally low interest rates artificially lower the cost of equity estimated by CAPM. In the 1981 cost of capital determination, when interest rates were high, the Interstate Commerce Commission (ICC) noted that "various shipper groups dislike the use of the CAPM methodology. . . ." The ICC also said that "[o]ne shipper notes that the CAPM approach is falling into disfavor in the financial community. . . ." The Board should be wary of flip-flopping to whichever model produces the lowest cost of capital as noted by the AAR in EP 664 (Sub-No. 2). *See* AAR Comments, EP 664 (Sub-No. 2), at 4 (filed Sept. 5, 2014). Indeed, as the Board itself has observed, "[a]s there are many different ways to

estimate the cost of equity, the Board must take great care not to swing back-and-forth between parties' preferred methodologies based on the results of the different approaches.”<sup>8</sup>

#### **VI. The Board Should Not Institute A Rulemaking Proceeding Regarding the Accounting Treatment of Leases**

Finally, WCTL renews its claim that the Board should treat operating leases as debt. This year, WCTL notes that FASB issued an Accounting Standards Update (“ASU”) that, according to WCTL, “calls for many operating leases to be as debt.” WCTL Reply at 11. WCTL calls on the Board to institute yet another rulemaking proceeding to deal with this accounting change. In support of its call for rulemaking, WCTL includes the 2-page splash page from FASB’s website, but it fails to provide the Board with the multi-volume, several hundred page document setting forth the actual proposal. Review of the actual document presents a more complicated picture.

In the past, the Board has expressed skepticism that it could “distinguish between various types of operating leases . . .” or how it could “rationally re-weight the costs of debt and equity, which are themselves a function of the actual debt-equity ratios of the carriers.”<sup>9</sup> Moreover, the changes put forth in ASU 842 will not be effective until December 2018. Until then, GAAP rules treating operating leases as expenses remain in place. In EP 720, the Board declined to consider changes to its rules in response to AAR’s request to conform R-1 reporting with GAAP rules already in effect. *Accounting and Reporting of Business Combinations, Security Investments, Comprehensive Income, Derivative Instruments and Hedging Activities*, EP 720

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<sup>8</sup> *R.R. Cost of Capital – 2005*, EP 558 (Sub-No. 9), slip op. at 4 (STB served Feb. 9, 2007).

<sup>9</sup> *Methodology to be Employed in Determining the Railroad Industry’s Cost of Capital*, EP 664, slip op. at 15 (STB served Jan. 17, 2008).

(STB served April 26, 2016). Given the high number of rulemaking proceedings currently opened and contemplated by the Board, the AAR submits that the Board should not waste its limited and valuable administrative resources by opening another proceeding on this issue.

### **Conclusion**

The Board should reject WCTL's arguments and determine that the railroads' cost of capital for 2015 is 9.61 percent.

Respectfully submitted,



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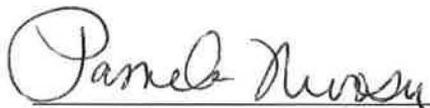
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(202) 639-2506  
Counsel for the Association  
of American Railroads

June 1, 2015

**CERTIFICATE OF SERVICE**

I hereby certify that on this 1<sup>st</sup> day of June, 2016, I have caused a copy of the foregoing to be served by first class mail, postage prepaid, on the following:

Robert D. Rosenberg  
Slover & Loftus  
1224 Seventeenth St, NW  
Washington, DC 20036-3003

  
Pamela Nwosu

## Market Risk Premiums for CAPM

This page is from the WCTL link in their Reply Statement. It says that their recommended equity risk premium (a.k.a. market risk premium) is to be used with a normalized risk-free rate of 4.0 percent. (Not the lower risk-free rate used by WCTL in their reply.) Note also that Duff & Phelps has already decided the the equity risk premium is too low, and increased it from 5.0% to 5.5%.

Taking these factors together, we find support for increasing our ERP recommendation relative to our previous recommendation.<sup>7</sup>

**TO BE CLEAR:**

- The Duff & Phelps U.S. ERP recommendation as of January 31, 2016 (and thereafter, until further notice) is 5.5%, matched with a normalized risk-free rate of 4.0%. This implies a 9.5% (4.0% + 5.5%) "base" U.S. cost of equity capital estimate as of January 31, 2016.
- Many valuations are done at year-end. The Duff & Phelps U.S. ERP recommendation for use with December 31, 2015 valuations is 5.0%, matched with a normalized risk-free rate of 4.0%. This implies a 9.0% (4.0% + 5.0%) "base" U.S. cost of equity capital estimate as of December 31, 2015.

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<sup>7</sup> The Duff & Phelps ERP estimate is made in relation to a risk-free rate (either "spot" or "normalized"). A "normalized" risk-free rate can be developed using longer-term averages of Treasury bond yields and the build-up framework outlined in Section 3 "Estimating the Risk-Free Rate", starting on page 9.

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## Market Risk Premiums for CAPM

This is the bottom half of a page from the *2016 Valuation Handbook, Guide to Cost of Capital*, by Duff & Phelps. It shows three different equity risk premiums. One of those premiums is the one the Board uses: the Long-term, "historical" (e.g., realized) ERP that was 6.90% at the end of 2015. The Duff & Phelps Recommended ERP is to be used with a normalized long-term risk-free rate of 4.0%.

**Long-term, "historical" (i.e., realized) ERP:** As of the end of 2015, the long-horizon historical equity risk premium was 6.90%.<sup>5.16</sup>

**Long-term "supply-side" ERP:** As of the end of 2015, the long-horizon supply-side equity risk premium was 6.03%.<sup>5.17</sup>

**Duff & Phelps Recommended ERP:** As of the end of 2015, the Duff & Phelps recommended ERP is 5.0% (developed in conjunction with a "normalized" long-term risk-free rate of 4.0%).<sup>5.18</sup>

The industry risk premia previously published in Table 3-5 of the *SBBi Valuation Yearbook* were full-information betas converted to industry risk premia using the long-term "historical" ERP in Formula 5.5. Appendix 3a provides industry risk premia calculated using the long-term "historical" ERP in the first column of industry risk premia (these industry risk premia are equivalent to the ones previously published in Table 3-5 of the former *SBBi Valuation Yearbook*).

<sup>5.15</sup> The industry risk premia previously published in Table 3-5 of the Morningstar/Ibbotson *SBBi Valuation Yearbook* were full-information betas converted to industry risk premia using only the "historical" long-term equity risk premium.

<sup>5.16</sup> Calculated as the average annual return of the S&P 500 total return index minus the average annual return of the SBBi long-term (20-year) government bond income return series over the 1926–2015 time period. The long-horizon historical equity risk premium was previously published on the "back page" of the Morningstar/Ibbotson *SBBi Valuation Yearbook* (discontinued).

<sup>5.17</sup> The supply-side equity risk premium was also previously published on the "back page" of the Morningstar/Ibbotson *SBBi Valuation Yearbook* (discontinued).

<sup>5.18</sup>

## Market Risk Premiums for CAPM

This is a full page from Appendix 3 of the *2016 Valuation Handbook, Guide to Cost of Capital*, by Duff & Phelps. It also says that the Duff & Phelps Recommended ERP “should be used in conjunction with” a 4.0% normalized risk-free rate of 4.0%.

CRSP Deciles Size Premia Study: Key Variables				
<b>Yield (Risk-free Rate)<sup>1</sup></b>				
Long-term (20-year) U.S. Treasury Coupon Bond Yield				2.68%
<b>Equity Risk Premium<sup>2</sup></b>				
Long-horizon expected equity risk premium (historical): large company stock total returns minus long-term government bond income returns				6.90
Long-horizon expected equity risk premium (supply-side): historical equity risk premium minus price-to-earnings ratio calculated using three-year average earnings				6.03
Duff & Phelps recommended equity risk premium (conditional): The Duff & Phelps recommended ERP was developed in relation to (and should be used in conjunction with) a 4.0% “normalized” risk-free rate. <sup>3</sup>				5.00
<b>CRSP Deciles Size Premium<sup>4</sup></b>				
Decile	Market Capitalization of Smallest Company (in millions)	-	Market Capitalization of Largest Company (in millions)	Size Premium (Return in Excess of CAPM)
Mid-Cap 3-5	\$2,090,566	-	\$9,611,187	1.00%
Low-Cap 6-8	448,502	-	2,083,642	1.70
Micro-Cap 9-10	1,963	-	448,079	3.58
<b>Breakdown of CRSP Deciles 1-10</b>				
1-Largest	\$22,035,313	-	\$629,010,254	-0.36%
2	9,618,053	-	21,809,433	0.57
3	5,205,841	-	9,611,187	0.86
4	3,195,898	-	5,199,952	0.99
5	2,090,566	-	3,187,480	1.49
6	1,400,931	-	2,083,642	1.63
7	845,509	-	1,400,208	1.62
8	448,502	-	844,475	2.04
9	209,880	-	448,079	2.54
10-Smallest	1,963	-	209,406	5.60
<b>Breakdown of CRSP 10th Decile</b>				
10a	\$108,692	-	\$209,406	4.04%
10w	148,934	-	209,406	3.04
10x	108,692	-	148,813	5.30
10b	\$1,963	-	\$108,598	8.76%
10y	64,846	-	108,598	7.32
10z	1,963	-	64,747	11.79
<sup>1</sup> As of December 31, 2015. <sup>2</sup> See Chapter 3 for complete methodology. <sup>3</sup> See Exhibit 3.15. <sup>4</sup> See Chapter 7 for complete methodology. <b>Note:</b> Examples on how these variables can be used are found in Chapter 8.				
<b>Sources of underlying data:</b> 1.) CRSP U.S. Stock Database and CRSP U.S. Indices Database © 2016 Center for Research in Security Prices (CRSP®), University of Chicago Booth School of Business, 2.) Morningstar Direct database, Used with permission. All rights reserved. Calculations performed by Duff & Phelps LLC.				
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### Weighted Average Cost of Capital Calculations

	MRP	beta	RF	COE	Wt-e	COD	Wt-d	WACC
1. WCTL's calculation that used CAPM with Wrong RF & COD	5.00	1.2167	2.55	8.63	0.8184	3.50	0.1816	7.70 %
2. Corrected WCTL CAPM	5.00	1.2167	4.00	10.08	0.8184	3.55	0.1816	8.89 %
3. Corrected WCTL CAPM with latest D&F MRP	5.50	1.2167	4.00	10.69	0.8184	3.55	0.1816	9.39 %
4. CAPM with MRP recommended by WCTL members in EP 664-2 table	9.10	1.2167	2.55	13.62	0.8184	3.55	0.1816	11.79 %
5. CAPM with MRP recommended by WCTL members plus MSDCF				12.30	0.8184	3.55	0.1816	10.71 %
6. Current STB Procedure				10.96	0.8184	3.55	0.1816	9.61 %

#### Notes:

1. WCTL calculation using Duff & Phelps recommended market risk premium (MRP) with wrong risk-free rate and slightly lower cost of debt. No MSDCF used. Duff & Phelps says that its recommended MRP "should be used in conjunction with" a 4.00 percent risk free rate.
2. WCTL calculation corrected to use the Duff & Phelps recommended risk-free rate and the correct cost of debt.
3. Same as 2 except using the latest market risk premium (5.5 percent) recommended by Duff & Phelps.
4. Calculation same as STB's CAPM calculation except market risk premium is median rate from AAR EP 664-2 table showing rates recommended by WCTL members in 2015. No MSDCF used.
5. Same as 4 except STB MS-DCF also used for cost of equity. Equity cost is average of CAPM of 13.62 and MSDCF of 10.97 = 12.30%.
6. Cost of Capital correctly using STB procedure (MSDCF and CAPM).

Preferred equity is ignored in all calculations on this page since its weight is 0%.

WACC = Weighted Average Cost of Capital    MRP = CAPM's Market Risk Premium    RF = CAPM's risk-free rate    COE = cost of equity    COD = cost of debt